

Claim 21 (original): The multilayer solder preform of claim 20 wherein the solder metal bonding component, the second solder metal preform layer, and the third solder metal preform layer are selected from the group consisting of Sn, Cu, In, Pb, Sb, Au, Ag, alloys thereof, a Bi alloy, and mixtures thereof.

Claim 22 (original): The multilayer solder preform of claim 21 wherein the additive comprises a thermal conductivity enhancement component selected from among Al, Al-coated Cu, Cu, Ag, Au, and alloys thereof, AlN, BeO, BN, high conductivity cermets, cuprates, silicides, and carbon phases.

Claim 23 (original): The multilayer solder preform of claim 21 wherein the additive comprises a thermal conductivity enhancement component which is uncoated and is selected from among Al, Cu, Ag, Au, and alloys thereof, AlN, BeO, BN, high conductivity cermets, cuprates, silicides, and carbon phases.

Claim 24 (original): The multilayer solder preform of claim 21 wherein the additive comprises a CTE modifying component selected from the group consisting of BeO, Al₂O₃, AlN, SiC, SiO₂, low expansion Fe-Ni alloys, low expansion ceramic powders, low expansion glass powders and mixtures thereof.

Claim 25 (currently amended): The solder preform of claim 21 wherein the additive comprises a CTE modifying component which is uncoated and is selected from the group consisting ~~of~~ of BeO, Al₂O₃, AlN, SiC, SiO₂, low expansion Fe-Ni alloys, low expansion ceramic powders, low expansion glass powders, and mixtures thereof.

Claim 26 (original): The solder preform of claim 20 wherein the solder metal bonding component, the second solder metal

preform layer, and the third solder metal preform layer are selected from the group consisting of Sn, Cu, In, Pb, Sb, Au, Ag, alloys thereof, a Bi alloy, and mixtures thereof; wherein the additive comprises a thermal conductivity enhancement component selected from among Al, Al-coated Cu, Cu, Ag, Au, and alloys thereof, AlN, BeO, BN, high conductivity cermets, cuprates, silicides, and carbon phases; and wherein the additive comprises a CTE modifying component selected from the group consisting of BeO, Al₂O₃, AlN, SiC, SiO₂, low expansion Fe-Ni alloys, low expansion ceramic powders, low expansion glass powders and mixtures thereof.

Claim 27 (currently amended): The solder preform of claim 20 wherein the solder metal bonding component, the second solder metal preform layer, and the third solder metal preform layer are selected from the group consisting of Sn, Cu, In, Pb, Sb, Au, Ag, alloys thereof, a Bi alloy, and mixtures thereof; wherein the additive comprises a thermal conductivity enhancement component which is uncoated and is selected from among Al, Cu, Ag, Au, and alloys thereof, AlN, BeO, BN, high conductivity cermets, cuprates, silicides, and carbon phases; and wherein the additive comprises a CTE modifying component which is uncoated and is selected from the group consisting ~~of~~ of BeO, Al₂O₃, AlN, SiC, SiO₂, low expansion Fe-Ni alloys, low expansion ceramic powders, low expansion glass powders, and mixtures thereof.

Claim 28 (original): The multilayer solder preform of claim 20 wherein the first solder preform layer further comprises an intrinsic oxygen getter selected from the group consisting of rare earth metals, alkali metals, alkaline-earth metals, refractory metals, Zn, mixtures thereof, and alloys thereof.

Claim 29 (original): The multilayer solder preform of claim 20 wherein the first layer has a thickness between about 0.001 inch (0.025 mm) and about 0.125 inch (3 mm), and the second and third layers each have a thickness between about 0.0001 inch (0.0025 mm) and about 0.02 inch (0.5 mm).

Claim 30 (original): The multilayer solder preform of claim 22 wherein the first layer has a thickness between about 0.001 inch (0.025 mm) and about 0.125 inch (3 mm), and the second and third layers each have a thickness between about 0.0001 inch (0.0025 mm) and about 0.02 inch (0.5 mm).

Claim 31 (original): The multilayer solder preform of claim 24 wherein the first layer has a thickness between about 0.001 inch (0.025 mm) and about 0.125 inch (3 mm), and the second and third layers each have a thickness between about 0.0001 inch (0.0025 mm) and about 0.02 inch (0.5 mm).

Claim 32 (original): A solder preform for bonding components of electronic devices comprising:

a sphere body comprising a sphere body solder metal bonding component and an additive component selected from among thermal conductivity enhancement components, CTE modifying components, and mixtures thereof; and

a sphere body surface layer comprising a solder metal over the sphere body.

Claim 33 (original): The solder preform of claim 32 wherein the sphere body solder metal bonding component and the sphere body surface layer are selected from the group consisting of Sn, Cu, In, Pb, Sb, Au, Ag, alloys thereof, and Bi alloys.

Claim 34 (original): The solder preform of claim 32 wherein the additive comprises a thermal conductivity enhancement component selected from among Al, Al-coated Cu, Cu, Ag, Au, and alloys thereof, AlN, BeO, BN, high conductivity cermets, cuprates, silicides, and carbon phases.

Claim 35 (original): The solder preform of claim 32 wherein the additive comprises a thermal conductivity enhancement component which is uncoated and is selected from among Al, Cu, Ag, Au, and alloys thereof, AlN, BeO, BN, high conductivity cermets, cuprates, silicides, and carbon phases.

Claim 36 (original): The solder preform of claim 32 wherein the additive comprises a CTE modifying component selected from the group consisting of BeO, Al₂O₃, AlN, SiC, SiO₂, low expansion Fe-Ni alloys, low expansion ceramic powders, low expansion glass powders and mixtures thereof.

Claim 37 (currently amended): The solder preform of claim 32 wherein the additive comprises a CTE modifying component which is uncoated and is selected from the group consisting of BeO, Al₂O₃, AlN, SiC, SiO₂, low expansion Fe-Ni alloys, low expansion ceramic powders, low expansion glass powders, and mixtures thereof.

Claim 38 (original): The solder preform of claim 32 wherein the sphere body solder metal bonding component and the sphere body surface layer are selected from the group consisting of Sn, Cu, In, Pb, Sb, Au, Ag, alloys thereof, a Bi alloy, and mixtures thereof; wherein the additive comprises a thermal conductivity enhancement component selected from among Al, Al-coated Cu, Ag, Au, and alloys thereof, AlN, BeO, BN, high conductivity cermets, cuprates, silicides, and carbon phases; and wherein the additive

comprises a CTE modifying component selected from the group consisting of BeO, Al₂O₃, AlN, SiC, SiO₂, low expansion Fe-Ni alloys, low expansion ceramic powders, low expansion glass powders and mixtures thereof.

Claim 39 (original): The solder preform of claim 32 wherein the sphere body solder metal bonding component and the sphere body surface layer are selected from the group consisting of Sn, Cu, In, Pb, Sb, Au, Ag, alloys thereof, a Bi alloy, and mixtures thereof; wherein the additive comprises a thermal conductivity enhancement component which is uncoated and is selected from among Al, Cu, Ag, Au, and alloys thereof, AlN, BeO, BN, high conductivity cermets, cuprates, silicides, and carbon phases; and wherein the additive comprises a CTE modifying component which is uncoated and is selected from the group consisting of BeO, Al₂O₃, AlN, SiC, SiO₂, low expansion Fe-Ni alloys, low expansion ceramic powders, low expansion glass powders and mixtures thereof.

Claim 40 (original): The solder preform of claim 32 wherein the sphere body further comprises an intrinsic oxygen getter selected from the group consisting of rare earth metals, alkali metals, alkaline-earth metals, refractory metals, Zn, mixtures thereof, and alloys thereof.

Claim 41 (original): The solder preform of claim 32 wherein the sphere body has a diameter of between about 0.003 inch (0.075 mm) and about 0.06 inch (1.5 mm), and the sphere body surface layer has a thickness between about 0.0005 inch (0.0125 mm) and about 0.05 inch (1.25 mm).

Claim 42 (original): The solder preform of claim 35 wherein the sphere body has a diameter of between about 0.003 inch (0.075 mm) and about 0.06 inch (1.5 mm), and the sphere body surface

layer has a thickness between about 0.0005 inch (0.0125 mm) and about 0.05 inch (1.25 mm).

Claim 43 (original): The solder preform of claim 36 wherein the sphere body has a diameter of between about 0.003 inch (0.075 mm) and about 0.06 inch (1.5 mm), and the sphere body surface layer has a thickness between about 0.0005 inch (0.0125 mm) and about 0.05 inch (1.25 mm).

Claim 44 (new): The thermal interface material of claim 1 wherein the CTE modifying component is selected from the group consisting of beryllium oxide, aluminum oxide, aluminum nitride, silicon carbide, silicon dioxide, low expansion iron-nickel alloys, low expansion ceramic powders, low expansion glass powders, and mixtures thereof.

Claim 45 (new): The thermal interface material of claim 12 wherein the additive component further comprises a thermal conductivity enhancement component having a thermal conductivity that is at least about 100 W/mK.